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A new species of *Pleurophragmium* from India

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Abstract — A new anamorphic species, *Pleurophragmium indicum* (*Ascomycota*), is described from India and illustrated. This litter-inhabiting fungus was collected from dead *Dendrocalamus strictus* leaves and is characterized by ellipsoidal to obovoid, straight to curved, transversely 3-septate, brown conidia. A key is provided to all accepted *Pleurophragmium* species.

Key words — biodiversity, microfungi, taxonomy

Introduction

During our studies on taxonomy and diversity of microfungi associated with flowering plants of Western Ghat forests in southern India, a hitherto unknown anamorphic ascomycete with affinities to *Pleurophragmium* Costantin was recovered from moist-chamber incubated leaf litter of the bamboo, *Dendrocalamus strictus*.

Materials & methods

Dried and freshly fallen leaves of *Dendrocalamus strictus* were thoroughly washed in distilled water and incubated in a sterile moist chamber for one to several days at room temp (22–25°C). The leaves were examined at 2-day intervals under a stereoscope fitted with incidental light. Grey-brown colonies with erect to slightly flexuous conidiophores with a crown of conidia appeared on the surface of the leaves after 5–7 days of incubation. The fungus was mounted on a slide with lactophenol and examined under a bright field light microscope.

Taxonomy

Pleurophragmium indicum M.A. D'Souza & Bhat, **sp. nov.** Figs. 1–4

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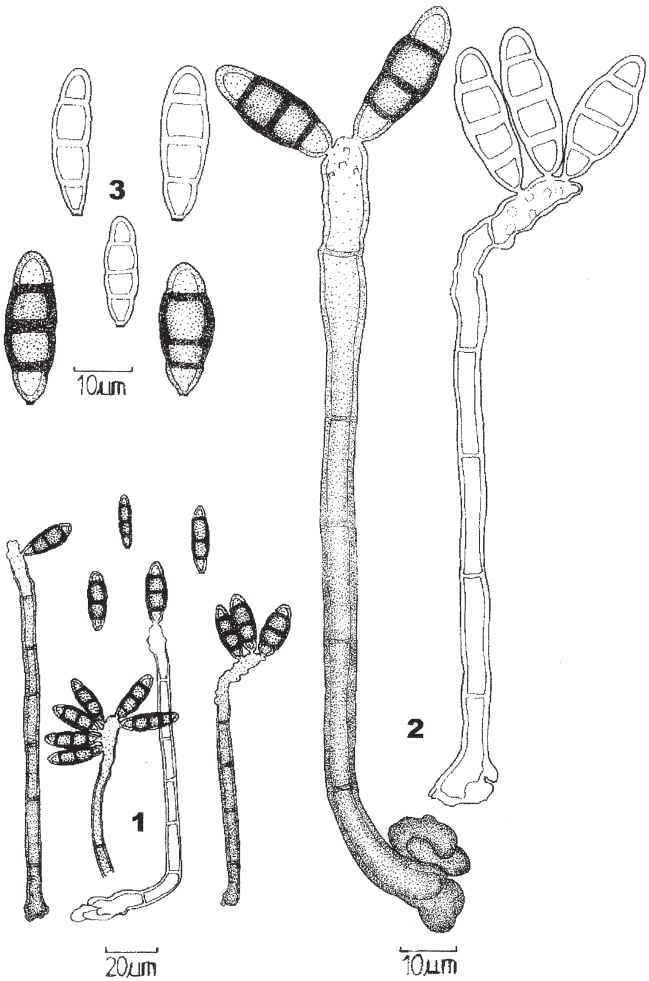
Differs from *P. bitunicatum* in conidia that lack a distinct outer covering and from *P. parvisporum* in its larger conidia and varied colouration.



Figs. 1–3. *Pleurophragmium indicum*.
1. Habit. 2. Magnified view of conidiophores with conidia. 3. Conidia.

Type: India, Molem Wildlife Sanctuary, Goa, on fallen dead and decaying leaves of *Dendrocalamus strictus* (Roxb.) Nees (*Poaceae*), 11 March 1999, leg. Maria A. D'Souza, (**Holotype**, GUBH 367).

Etymology: from the country of the type locality.

Colonies effuse, dark brown to black, velvety on the natural substrate. Mycelium partly immersed and partly superficial. Conidiophores mononematous, scattered, erect, straight to slightly flexuous, swollen and rhizome-like at the

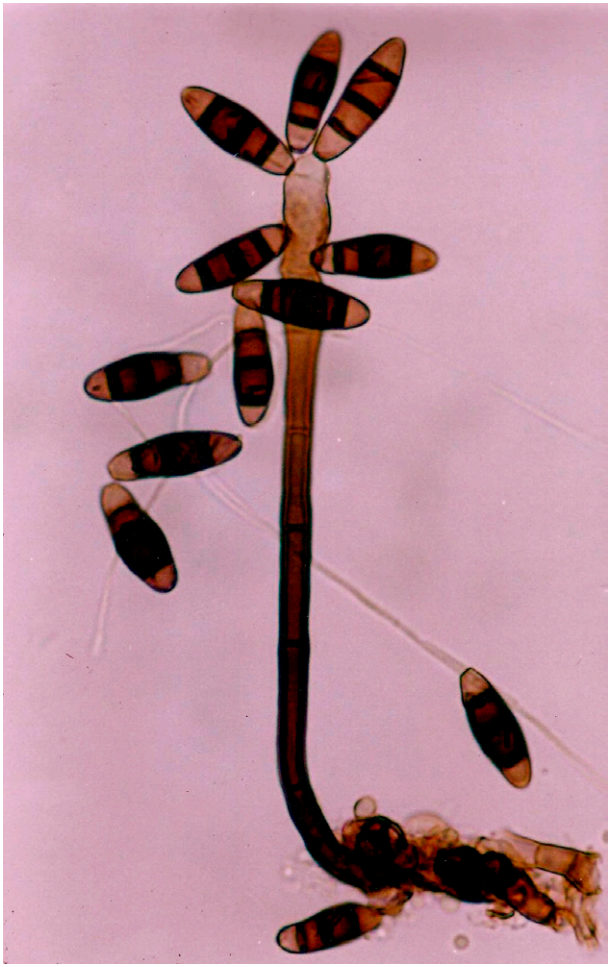


Fig. 4. *Pleurophragmium indicum*. Conidiophores and conidia, 600×.

base, smooth, 4–6-septate, dark brown below, pale brown in the middle and above, thick-walled, 100–160 μm long, 7–22 μm wide at base, 4.5–6.5 μm wide in the middle and near apex. Conidiogenous cells polyblastic, integrated, terminal, cylindrical, sympodial, minutely denticulate, noncicatrized, smooth, pale brown to subhyaline, 15–23 × 4.5–9.5 μm. Conidia solitary, simple, dry, ellipsoidal to obovoid, rounded at the apex, narrower at the base, straight to slightly curved, smooth, transversely 3-septate, middle cells dark brown, end cells pale brown, 20–30 × 4.5–11 μm, 3–5 μm wide at the ends.

Discussion

The genus *Pleurophragmium*, with *P. bicolor* Costantin [= *P. simplex* (Berk. & Broome) S. Hughes] as type, includes 37 currently accepted taxa, with 27 other names placed in synonymy (Hughes 1958, Ellis 1971, 1976, Matsushima 1975, Kirk et al., 2008). Although the conidia are similar in shape and pigmentation to *Curvularia* Boedijn (Ellis 1971), *P. indicum* is differentiated by its blastic mode of conidial development.

Of those validly described species, *P. bitunicatum* Matsush., which resembles *P. indicum* in pigmentation and conidial size, differs by having conidia with distinct outer covering. *Pleurophragmium parvisporum* (Preuss) Hol.-Jech.

Table 1. Comparison of accepted species of *Pleurophragmium*

Species	Substrate	Type locality
P. acutum (Grove) M.B. Ellis 1976	Dead stems of *Urtica dioica*	England
P. angamosense Matsush. 1995	Decayed petiole of palm	Peru
P. aquaticum R.F. Castañeda et al., 2007	Decaying wood submerged in a stream	Mexico
P. arecae Matsush. 1987	Decaying leaves of *Areca catechu*	Taiwan
P. bicolor Matsush. 1975, nom. illegit.	Decayed leaves of *Quercus*, *Podocarpus*	Japan
P. bitunicatum Matsush. 1975	Decaying leaves	Japan
P. cylindrosporum Matsush. 1975	Decaying leaves	Japan
P. harunganae Hansf.1946	Pustules of *Hemileia* in leaves of *Harungana madagascariensis*	Uganda
P. hippotrichoides (Corda) M.B. Ellis 1976	Dead leaves, stems of *Cortaderia selloana*, *Umbilicus rupestris, Pandanus sylvestris,* and *Phormium tenax*	Europe, Channel Islands
P. indicum	Dead and decaying leaves of *Dendrocalamus strictus*	India
P. malaysianum Matsush. 1996	Decaying leaves	Malaysia
P. miniumbonatum (R.F. Castañeda et al.) R.F. Castañeda 2007	Fallen decaying leaves	Venezuela
P. naviculiforme Matsush. 1975	Decaying leaves	Japan
P. obcampanuloides Matsush. 1995	Decaying stems	Japan
P. parvisporum (Preuss) Hol.-Jech., 1972	Rotten leaves of *Musa sapientum*	Taiwan
P. peruamazonicum Matsush.1993	Decaying leaves of palm	Peru
P. peruamazonicum var. *inflatum* Matsush. 1993	Decaying and rotten leaves of palm	Peru
P. simplex (Berk.& Broome) S. Hughes 1958	Partly decorticated dead stems of *Urtica, Brassica, Polygonum*	Europe
P. subfusiforme Matsush. 1975	Decaying stems	Japan
P. triseptatum Matsush. 1975	Decaying stems	Japan
P. tritici M. B. Ellis 1976	Dead wheat culms	Ireland
P. varieseptatum Matsush. 1975	Decaying leaves of *Phyllostachys edulis*	Japan
P. verruculosum D.P. Tiwari 1970	Rhizosphere soil of *Piper betle*	India

produces similarly shaped conidia but differs in the uniformly pale ochraceous conidia that also are markedly smaller (14.5–25 × 4.5–6.5 μm).

Twenty-three accepted taxa of *Pleurophragmium* are compared (Table 1) and keyed out below.

Key to accepted taxa of *Pleurophragmium*

1. Conidia with 2 tunicae ..... *P. bitunicatum*
1a. Conidia without a tunica 2

2. Conidia smooth or indistinctly granular, 12–18 × 5–7μm ..... *P. harunganae*
2a. Conidia verrucose, finely verruculose or minutely echinulate 3
2b. Conidia smooth 4

3. Conidia verrucose, subclavate to clavate, 10–16.5 × 3.3–5 μm ..... *P. verruculosum*
3a. Conidia finely verruculose, ellipsoidal, 9–14 × 6–8 μm hyaline .. *P. hippotrichoides*
3b. Conidia minutely echinulate, ellipsoidal to fusiform, 6–11 × 3–4 μm ..... *P. tritici*

4. Conidia hyaline 5
4a. Conidia subhyaline to dematiaceous 6

5. Conidia naviculate, 6–12 × 2–3 μm ..... *P. naviculiforme*
5a. Conidia fusiform to ellipsoidal, 18–32 × 6.5–10 μm ..... *P. acutum*
5b. Conidia cylindro-clavate, (20 –) 40–75 × 4–5 μm ..... *P. malaysianum*

6. Conidia subhyaline 7
6a. Conidia dematiaceous 8

7. Conidia fusiform, curved, 3–7-septate, 21–38 × 5.8–9.2 μm ..... *P. subfusiforme*
7a. Conidia cylindrical, (1–)3(– 6)-septate, 14–25 × 4–5.7 μm ..... *P. triseptatum*
7b. Conidia fusiform to obclavate, (2–)3(–4)-septate, 12–24 × 3–4.5 μm ..... *P. arecae*

8. Conidia cylindrical 9
8a. Conidia of other shapes, not cylindrical 12

9. Conidia usually 3-septate 10
9a. Conidia 2– or 1–4-septate 11

10. Conidia pale to moderately brown, (15–) 20–28 × 2.8–4 μm
..... *P. bicolor* Matsush., nom. illegit.
10a. Conidia central cells brown, terminal cells pale brown, 25–40 × 5–6 μm
..... *P. cylindrosporum*

11. Conidia varicolored with a pale brown central cell and subhyaline terminal cells, 2-septate, 18–30 × 4–6 μm ..... *P. peruamazonicum*
11a. Conidia pale olive, 1–4-septate, 8–22 × 3–5 μm ..... *P. varieseptatum*

12. Conidia 1–2-septate 13
12a. Conidia 3 or more septate 14

13. Conidia obpyriform to turbinate, 1–2-septate, 11.5–15.5 × 5–6.5 μm .....
..... *P. obcampanuloides*
13a. Conidia ovoid, (1–) 2-septate, 17–28 × 8–1.5 μm
..... *P. peruamazonicum* var. *inflatum*

14. Conidia 5-septate, fusiform, slightly curved or straight, 24.5–40 × 5–7 µm ..... *P. angamosense*
14a. Conidia 3-septate, ellipsoidal to obovoid or fusiform to clavate 15
14b. Conidia 3–4-septate, obovoid, oblong, ellipsoidal to subclavate 16
15. Conidia ellipsoidal to obovoid, straight to curved, 20–30 × 3–11 µm ... *P. indicum*
15a. Conidia fusiform to clavate, sometimes navicular, 25–30 × 6.0–6.5 µm ..... *P. aquaticum*
16. Conidia ellipsoidal to subclavate, 10–21 × 3.5–6 µm ..... *P. simplex*
16a. Conidia obovoid, pyriform to broad clavate 17
17. Conidia obovoid, 10–25 × 4–6.5 µm ..... *P. parvisporum*
17a. Conidia obovoid, pyriform to broad clavate, umbonate at the apex, 16–19 × 6–7 µm ..... *P. miniumbonatum*

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